UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/674,442	11/01/2000	Hiroyuki Ehara	L9289.00109	8618

7590 08/03/2004

Stevens Davis Miller & Mosher
Suite 850
1615 L Street NW
Washington, DC 20036

EXAMINER	
JACKSON, JAKIEDA R	

ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 08/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/674,442	EHARA ET AL	
	Examiner	Art Unit	
	Jakieda R Jackson	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10,11,13,18 and 20* is/are allowed.

6)☒ Claim(s) *1-9,12, 14-17,19,21-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 November 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. **Claims 12 and 14** are objected to because of the following informalities:

- Regarding **claim 12**, the preamble is inconsistent with independent base claim 9 and there is no antecedent for "the random codebook" and "the partial algebraic codebook", hence claim 12 should be dependent on claim 10.
- Regarding **claim 14**, "for dispersion a pattern" should --for generating a dispersion pattern--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 14 and 16** are rejected under 35 U.S.C. 102(e) as being anticipated by Yasunaga et al. (U.S. Patent No. 6,415,254), hereinafter referenced as Yasunaga.

Regarding **claim 14**, Yasunaga discloses a sound encoder and decoder comprising:

an algebraic codebook (algebraic codebook) for storing an excitation vector (excitation vector; column 7, lines 62-65);

dispersion pattern generating means (figure 6, element 415) for generating a dispersion pattern corresponding to a power level (distortion power; column 11, lines 39-48) of a noise interval in speech data (column 16, lines 49-57);

pattern dispersion generating means (dispersion pattern) for generating a dispersion pattern of the excitation vector (generate the excitation vector) output from

the algebraic codebook (algebraic excitation generator) according to the dispersion pattern (column 4, line 50 – column 5, line 6).

Regarding **claim 16**, Yasunaga discloses a sound encoder and decoder wherein the dispersion pattern generating means (figure 6, element 415) generates the dispersion pattern corresponding to a mode of the speech data (voiced or unvoiced; column 12, lines 37-54).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yasunaga in view of Yasunaga et al. "Pulse Kakusan Onegen wo mochiita CELP Houshiki no Hinshitsu Kaizen", hereinafter referenced as Ehara (English translation is referenced for rejection).

Regarding **claim 15**, Yasunaga discloses a sound encoder and decoder, but lacks wherein the dispersion pattern generating means generates a dispersion pattern with strong noise characteristics when an average background noise power level is

high, while generating a dispersion patter with weak noise characteristics when the average background noise power level is low.

Ehara discloses a sound encoder and decoder wherein the dispersion pattern generating means generates a dispersion pattern with strong noise characteristics (strong) when an average background noise power level is high (noisy), while generating a dispersion patter with weak noise characteristics (weak) when the average background noise power level is low (pulse-like; Tables 1 and 2 with page 4-6), to detect speech frames in a noisy environment.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yasunaga's invention such that it disperses patterns with stong/weak noise characteristics when an average background noise is high/low, to detect speech frames in a noisy environment so that the coding performance for speech signals in a noisy environment can be improved.

7. **Claims 1, 4, 7-8, 17 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Haggvist et al. (U.S. Patent No. 5,327,519), hereinafter referenced as Haggvist, in view of Hayashi et al. (U.S. Patent No. 5,970,444), hereinafter referenced as Hayashi.

Regarding **claim 1**, Haggvist discloses an excitation generating apparatus and method (plurality of excitation vectors are formed; column 11, lines 2-4):

pulse position determining means (pre-determined pulse patterns) for determining a first pulse and a second pulse (P1, P2, P3...Pp; column 10, lines 57-58 with claim 3a)

random code vector generating means (a random codebook) for generating a first random code vector (of random vectors; column 1, lines 47-49) based on respective positions of the first pulse and the second pulse (abstract), but lacks that the first and second pulses are adjacent to each other.

Hayashi discloses an apparatus and method where the first and second pulses are adjacent to each other (figure 5), for reducing bit(s).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Haggvist's invention such that the first and second pulses are adjacent to each other, to reduce bit(s) while suppressing a degradation in quality of decoded speech to an unnoticeable level (column 6, lines 36-40).

Regarding **claim** 4, Haggvist discloses an excitation generating apparatus and method further comprising:

a random codebook (a random codebook) for storing a second random code vector (of random vectors; column 1, lines 47-49); and

wherein the random code vector generating means (random codebook) generates a random a code vector from the first random code vector and the second random code vector (random vectors; column 1, lines 47-49) but lacks including a plurality of pulses being not adjacent to each other.

Hayashi discloses a method and apparatus including a plurality of pulses being not adjacent to each other (figure 6; pulse #0 and pulse #1, tracks 1 and 2), to reduce distortion in synthesized speech.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Haggvist's invention such that it includes a plurality of pulses being not adjacent to each other, to permit a bit rate to be reduced without the degradation in the speech quality (column 3, lines 36-40).

Regarding **claim 7**, Haggvist discloses an apparatus and method comprising an excitation vector generating apparatus (fig 1a, element 3; column 3, lines 31-34).

Regarding **claim 8**, Haggvist discloses an excitation generating apparatus and method comprising:

excitation vector generating means (figure 1a, element 3) for generating a new excitation vector (column 3, lines 31-34 with column 11, lines 7-12) from an adaptive code vector output (column 4, lines 27-32) from an adaptive codebook (adaptive codebook) storing an excitation vector (excitation vector; column 6, lines 12-18);

excitation vector updating means for updating (creating) the excitation vector (excitation vector) stored in the adaptive codebook (claim 3b with column 6, lines 12-18) to the new excitation vector (new set of pulse patterns; column 11, lines 7-12); and

speech synthesis signal generating means (synthesis filter; figure 1, element 16) for generating a speech synthesis signal (speech signal is generated) using the new excitation vector (suitable excitation signal; column 1, lines 20-44 and lines 62-64) but lacks a random code vector output from a partial algebraic codebook storing a random

code vector obtained in the excitation vector generating apparatus and a linear predictive result in which the input signal is quantized.

Hayashi discloses an apparatus and method comprising:

a random code vector output (random code vectors; column 1, lines 39-67) from a partial algebraic codebook (algebraic codebook; figures 6-10; column 6, line 52 – column 7, line 10 and column 9, lines 56-64) storing a random code vector (random exciting vectors) obtained in the excitation vector generating apparatus (21); and

linear predictive analysis result (LPC) in which an input signal is quantized (filter coefficient quantizer; figure 1, element 15 with column 1, lines 39-51), to minimize the power in the distortion.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Haggvist's invention such that it discloses a random code vector output from a partial algebraic codebook storing a random code vector obtained in the excitation vector generating apparatus and a linear predictive result in which the input signal is quantized, to minimize the power in the distortion which allows reduction of degradation in speech quality (column 3, lines 36-40).

Regarding **claim 17**, Haggvist discloses an excitation apparatus and method comprising a base station apparatus (CELP; column 1, lines 11-19).

Regarding **claim 19**, Haggvist discloses an excitation apparatus and method comprising a communication terminal apparatus (coder, communication by using a coding scheme; column 1, lines 11-44).

8. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Haggvist in view of Hayashi, as applied to claim 1 above, in further view of Wake et al. (JP 02-294700), hereinafter referenced as Wake (English translation is referenced for rejection).

Regarding **claim 5**, Haggivist in view of Hayashi disclose a speech coding apparatus and method, but lacks mode determining means and pulse candidate number controlling means.

Wake discloses a speech coding apparatus and method comprising:

mode determining means for determining a speech mode (voiced or unvoiced state; page 3); and

pulse candidate number controlling means for increasing and decreasing (set to be large/small) the number of excitation vectors by controlling an interval of pulses (number of pulses) adjacent to each other corresponding to the determined speech mode (page 4 and page 7), for improving the quality of synthesized voice.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Haggvist in combination with Hayashi's invention wherein it discloses mode determining means and pulse candidate number controlling means, to compensate for the deterioration of the synthesized sound quality caused by a reduction in the coded bit number of the sound-source pulses (page 7).

9. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Haggvist in view of Hayashi, in further view of Wake, as applied to claim 5 above, in further view of Roworth (U.S. Patent No. 3,825,685).

Regarding **claim 6**, Haggvist in view of Hayashi, in further view of Wake disclose a speech coding apparatus and method, but lacks average power calculating means.

Roworth discloses a speech synthesizer and excitation system comprising:

average power calculating means for calculating a level of average power of an excitation signal (equalize the average power; column 6, lines 50-64) when the determined speech mode is a noise mode (column 5, lines 13-14 and column 6, lines 36-39),

wherein said pulse position candidate number controlling means increases (increase the pulse) or decreases the number of the predetermined pulse position candidates based on the average power (column 6, lines 50-64), to obtain a high pulse rate during random excitation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Haggvist in view of Hayashi in further view of Wake invention such that it discloses an average power calculating means to calculate a level of average power of an excitation signal, to obtain a certain energy (column 6, lines 60-64) which will minimize distortion of a speech signal (column 1, lines 8-12, for high speech quality.

10. **Claims 2, 21-22 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Haggvist in view of Hayashi, as applied to claim 1 above, in further view of Nomura (U.S. Patent No. 6,094,630).

Regarding **claim 2**, Haggvist in view of Hayashi discloses an excitation generating apparatus and method but lacks comprising a first pulse position selecting means and a second pulse position selecting means. Nomura discloses a speech coding device comprising:

first pulse position selecting means (first pulse generating circuit; figure 2, element 11) for selecting a position of the first pulse among predetermined pulse position candidates (column 2, lines 53-62 and column 6, lines 27-30); and

second pulse position selecting means (second pulse generating circuit; figure 2, element 12) for selecting a position of the second pulse (column 6, lines 31-35), to determine the excitation signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Haggvist and Hayashi's invention such that it includes a first pulse position selecting means and a second pulse position selecting means, to determine the excitation signal, so that distortion between an input signal and a reproduced speech signal, obtained by exciting a synthetic filter using the excitation signal, may be minimized, as taught by Nomura (column 2, lines 56-61).

Regarding **claims 21 and 24**, it is interpreted and rejected for the same reasons as set forth for the combination of claims 1 and 2.

Regarding **claim 22** it is interpreted and rejected for the same reasons as set forth for claim 2.

11. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Haggvist in view of Hayashi and further in view of Nomura, as applied to claim 2 above, in further view of Naoya (JP 07-295596, rejections written from the JPO English translation).

Regarding **claim 3**, Haggvist in view of Hayashi in further view of Nomura discloses a speech coding apparatus and method but lacks:

control means for controlling the first pulse position selecting means or the second pulse selecting means so that the position of a pulse determined in the pulse position determining means is not out of a frame.

Naoya discloses a speech coding device comprising:

control means (Main pulse train) for controlling the first pulse position selecting means or the second pulse selecting means so that the position of a pulse determined in the pulse position determining means is not out of a frame controlled (every voice frame is controlled; page 2, paragraph 0008 and page 3, paragraph 0015), to improve speech quality.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Haggvist in view of Hayashi in further view of Nomura's invention such that it controls the first pulse position selecting means or the second pulse selecting means so that the position of a pulse determined in the pulse

position determining means is not out of a frame, to form control parameters which will improve the quality of speech (page 3 of 3, paragraph 0013).

12. **Claims 9, 12 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasunaga (U.S. Patent No. 6,415,254) in view of Hayashi.

Regarding **claims 9 and 23**, Yasunaga discloses a speech decoding apparatus comprising:

excitation parameter decoding means (excitation information generator of speech coder/decoder) for decoding excitation parameters including position information (pulse position; column 7, lines 53-61) on an adaptive code vector (column 1, line 66 – column 2, line 4) and index information (index for pulse vectors; column 8, lines 38-43 and column 9, lines 42-56) to designate a random code vector (column 1, line 66 – column 2, line 4);

excitation vector generating mean (adding section; figure 5, element 308) for generating an excitation vector using the adaptive code vector (column 10, lines 23-25) obtained from the position information on the adaptive code vector (table 2) and the random code vector having at least two pulses (table 2 and column 27, lines 1-10);

excitation vector updating means (adding section; figure 5, element 308) for updating the excitation vector stored in the adaptive codebook (adaptive codebook; figure 2, element 303) to generated excitation vector (column 10, lines 22-28); and

speech synthesis signal generating means (synthetic filter; figure 2, element 39) for generating a speech synthesis signal (synthetic speech) using the generated

excitation vector (generates and excitation vector; column 2, lines 56-64 and column 15, lines 49-57) and a decoded result of quantized linear predictive analysis result (linear prediction analyzing section; figure 1, element 12) transmitted form a coding side (coding section; figure 1, element 13; column 1m lines 32-44, but lacks having at least two pulses adjacent to each other obtained from the index information.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yasunaga's invention such that it has at least two pulses adjacent to each other obtained from the index information, to reduce bit(s) while suppressing a degradation in quality of decoded speech to an unnoticeable level (column 6, lines 36-40), as taught by Hayashi.

Regarding **claim 12**, Yasunaga discloses a speech decoding apparatus wherein a rate of the random codebook is increased (random code vector greatly increased) by a portion corresponding to a decreased size of portion algebraic codebook (algebraic excitation vector generator expressed by a *few* signed pulses; column 4, lines 15-31).

Allowable Subject Matter

13. **Claims 10-11, 13, 18 and 20** are allowed.

The following is a statement of reasons for indication of allowance:

As for independent **claim 10**, it recites a random codebook used adaptively corresponding to a size of a partial algebraic codebook. Prior art, such as Nomura, disclose a similar codebook, but fails to teach nor fairly suggest the recited configuration wherein a random codebook is used adaptively corresponding to a size of a partial algebraic codebook, to achieve a speech coding apparatus with a low bit rate and a small computation amount.

Dependent **claims 11, 13, 18 and 20** are allowed because they further limit their parent claims.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- U.S. Patent No. 5,377,302 to Tsiang discloses a system for recognizing voice.
- U.S. Patent No. 5,754,976 and 5,444,816 to Adoul et al. discloses an algebraic codebook with signal-selected pulse amplitude/position combinations for fast coding speech and dynamic codebook for efficient speech coding based on algebraic codes.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jakieda R Jackson whose telephone number is 703.305.5593. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis I. Smits can be reached on 703. 306-3011. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JRJ
July 21, 2004

W. R. YOUNG
PRIMARY EXAMINER